Project Delivery Network

Structure Design QC Checklist

Version
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Introduction

The Project Delivery Network Structure QC Checklist is to be used with the *UDOT QC/QA Procedures*. This checklist is a tool to assist the project team in verifying all work is produced with due diligence, using acceptable industry standard techniques, available resources and data, and reasonable decisions by competent professionals. The checklist is a tool for the delivery of quality documents and cannot replace the sound judgment and experience of competent professionals. It is the Design Team's responsibility to verify the quality of project documents **before** distribution.

Checklist Instructions

For each deliverable listed, the QC Checker is to verify all items listed in the checklist are complete, along with any additional items the QC Checker deems necessary. The checklist items are not to be interpreted as the only items that need to be verified.

Once all items are verified, the Verifier is to sign the associated cover sheet and upload it onto ProjectWise. The QC is not complete until the cover sheet is signed, dated, and uploaded onto ProjectWise. See the *Project Delivery Network QC/QA Procedure* for the appropriate cover sheet.

QC reviews are to be completed **before** distribution.

The following explanations are to aid in completing the QC checklist items:

- A checklist item deemed "complete", "correct", or "accurate" does not denote that the item is perfect, but rather that the item satisfies design criteria based on known information, acceptable techniques, and sound judgment."
- A checklist item deemed "addressed" denotes the item as "reviewed all known concerns and verified the concerns are appropriately mitigated and satisfy design criteria." Addressed concerns are not necessarily incorporated into the design, but satisfactorily mitigated.
- A checklist item deemed "identified" denotes the item as "an acceptable and economical approach to satisfy design criteria based on known information."
- A checklist item deemed "verified" denotes the item as "verified the approach/conclusion as acceptable based on known information."
- Use the check boxes to verify the checklist items are complete. If a checklist item is *not applicable* to the current project, place an NA over the check box.
- Use the comment sections of the cover sheet to address exceptions, assumptions, and unique aspects of the project. The comments will help others understand why certain decisions were made and their impacts on the project.

1S1 Identify Preliminary Structure Type (Minor & Major)

Review the existing conditions and determine the physical requirements for any new structures. Develop a range of alternative structure types to fulfill the requirements.

References

1. AASHTO LRFD Bridge Design Specifications
2. UDOT Structures Design and Detailing Manual
3. UDOT Project Delivery Network
4. UDOT QC/QA Procedures
5. UDOT Practical Design Guide

Preliminary Structure Type(s) Selection Report

1. ☐ Structural as-built drawings were requested.
2. ☐ Structural Inventory and Appraisal Sheets were requested.
3. ☐ Structure recommendations reports and concept reports were requested and addressed.
4. ☐ Met with UDOT Structures Project Manager.
5. ☐ A field visit was conducted and observations were compared to existing structure documents (as-built, SI&A sheets).
6. ☐ For each structure type, feasible alternatives were adequately evaluated.
    a. ☐ ABC Decision Making Procedure document is complete.
    b. ☐ Traffic impacts adequately evaluated.
    c. ☐ Need for design waivers, exceptions, and deviation from standards was evaluated.
    d. ☐ Construction phasing and limitations are feasible (coordinated with the Design Leader).
    e. ☐ Aesthetic concepts have been evaluated.
    f. ☐ Environmental document commitments are addressed.
    g. ☐ Right-of-way requirements evaluated.
    h. ☐ The needs of Utilities, ATMS, sign panels, and other special needs were considered.
    i. ☐ Advantages and disadvantages are identified.
    j. ☐ Final analysis and justification for eliminating or advancing alternatives is appropriate
7. ☐ For new major structure and/or widening, the following items are adequately addressed/identified and analyzed.
    a. ☐ Hydraulic considerations
    b. ☐ Number of spans and preliminary span lengths
    c. ☐ Preliminary girder type
    d. ☐ Preliminary structure depth

1S1 Continued

e. ☐ Preliminary bent and abutment locations

f. ☐ Preliminary abutment types

8. ☐ For major structure rehabilitation, the following items are adequately addressed/identified and analyzed.

   a. ☐ Preliminary work items

   b. ☐ Rehabilitation strategy

   c. ☐ Scour countermeasure needs

9. ☐ For new minor structure and/or extensions, the following items are adequately addressed/identified and analyzed.

   a. ☐ Preliminary box culvert type and size

   b. ☐ Preliminary wall type, height, and length

   c. ☐ Preliminary headwall layout

10. ☐ For minor structure rehabilitation, the following items are adequately addressed/identified and analyzed.

    a. ☐ Preliminary work items

    b. ☐ Rehabilitation strategy

11. ☐ Preliminary quantities and construction cost estimates appropriately consider all aspects of proposed structural designs.

12. ☐ If a railroad is within the structure limits, coordination with the railroad company has occurred.

3S1 Develop Type Selection Report (TSR) and Seismic Strategy Report

Determine bridge layout and geometry for design. Finalize the Type Selection Report and develop the Preliminary Seismic Strategy Report.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Guide Specifications for LRFD Seismic Bridge Design
3. UDOT Standard and Supplemental Drawings
4. UDOT Structures Design and Detailing Manual
5. Type Selection Report Template
6. Seismic Strategy Report Template
7. UDOT Project Delivery Network
8. UDOT QC/QA Procedures
9. UDOT Practical Design Guide

Final Type Selection Report

1. ☐ The Structure Design Criteria is complete.
    a. ☐ The most current roadway geometry was used to determine the design criteria.
    b. ☐ Clearance and structural geometry conform to current UDOT Standard Drawings.
    c. ☐ Appropriate clearance is provided.
2. ☐ The structure cross section meets current UDOT Standard Drawings.
    a. ☐ The superelevation criteria conform to current UDOT Standard Drawing.
    b. ☐ The cross section has been coordinated with roadway.
3. ☐ The Type Selection Report meets the project criteria and UDOT requirements.
4. ☐ The Type Selection Report is appropriate based on advantages and disadvantages.
5. ☐ If a railroad is within the structure limits, the existing track configuration and spacing was accepted by the railroad company.
6. ☐ If a railroad is within the structure limits, the selection meets railroad requirements.
    a. ☐ Vertical and horizontal clearances
    b. ☐ Correct track separations and future tracks
    c. ☐ Structure type
    d. ☐ Crash walls
    e. ☐ Fencing and understructure lighting
    f. ☐ Construction staging, shoring, soil stabilization, etc.

3S1 Continued

7. ☐ The preliminary bid items and cost estimate are an accurate depiction of all anticipated items and costs.

Preliminary Seismic Strategy Report

1. ☐ The design strategy for resisting the design seismic event is adequately described.
2. ☐ Descriptions of expected damage, locations of plastic hinging, redistribution forces, mobilization of backfills, and functions of bearings are appropriate.
3. ☐ Existing structures evaluated for seismic retrofit.

3S2 Develop Situation and Layout (S&L) for Minor Structures

Develop the S&L sheets for minor structures (box culverts, headwalls, etc.), fully coordinating with the roadway geometric and hydraulic requirements.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Guide Specifications for LRFD Seismic Bridge Design
3. UDOT Structures Design and Detailing Manual
4. UDOT CADD Standards
5. UDOT Standard and Supplemental Drawings
6. UDOT Project Delivery Network
7. UDOT QC/QA Procedures
8. UDOT Practical Design Guide

S&L Sheets

1. ☐ Minor structures S&L sheets are complete.
   a. ☐ The design meets project criteria and requirements.
   b. ☐ The minor structure design conforms to UDOT and industry standards.
   c. ☐ The minor structure(s) can be reasonably constructed and has a plausible phasing scheme.
2. ☐ If a railroad is within the structure limits, the following are complete and ready to submit to the Railroad Company.
   a. ☐ Required Railroad Information Sheet
   b. ☐ Overhead Submittal Checklists
   c. ☐ Overhead Grade Separation Data Sheet

Initial Design Exception, Design Waiver, or Deviation from UDOT Standard Form

1. ☐ All design exceptions, design waivers, and deviations from UDOT standards considered are appropriate.
2. ☐ All necessary forms have been submitted.

3S3 Develop Situation and Layout (S&L) for Rehabilitation

Develop list of expected structural repair work items for the structure.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Guide Specifications for LRFD Seismic Bridge Design
3. UDOT Structures Design and Detailing Manual
4. UDOT CADD Standards
5. UDOT Standard and Supplemental Drawings
6. UDOT Project Delivery Network
7. UDOT QC/QA Procedures
8. UDOT Practical Design Guide

S&L Sheets

1. ☐ All required and desired structural repairs are addressed.
2. ☐ S&L sheets are complete.
    a. ☐ The design meets project criteria and requirements.
    b. ☐ The design conforms to UDOT and industry standards.
    c. ☐ The rehabilitation can be reasonably constructed and has a plausible phasing scheme.
3. ☐ If a railroad is within the structure limits, the following are complete and ready to submit to the Railroad Company.
    a. ☐ The required Railroad Information Sheet
    b. ☐ The Overhead Submittal Checklists
    c. ☐ The Overhead Grade Separation Data Sheet

Initial Design Exception, Design Waiver, or Deviation from UDOT Standard Form

1. ☐ All design exceptions, design waivers, and deviations from UDOT standards considered are appropriate.
2. ☐ All necessary forms have been submitted.

3S4 Develop Situation and Layout (S&L) for Retaining Walls

Develop the S&L sheets for each wall, fully coordinating with the roadway, grading, and geotechnical requirements.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Guide Specifications for LRFD Seismic Bridge Design
3. UDOT Structures Design and Detailing Manual
4. UDOT CADD Standards
5. UDOT Standard and Supplemental Drawings
6. UDOT Project Delivery Network
7. UDOT QC/QA Procedures
8. UDOT Practical Design Guide

S&L Sheets

1. ☐ Retaining walls S&L sheets are complete.
    a. ☐ The type, top of wall treatment, and overall design is appropriate for the proximity and interaction with adjacent structures and waterway.
    b. ☐ The design meets the project criteria and requirements.
    c. ☐ The design conforms to UDOT and industry standards.
    d. ☐ The structure can be reasonably constructed and has a plausible phasing scheme.
2. ☐ If a railroad is within the structure limits, the following are complete and ready to submit to the Railroad Company.
    a. ☐ The required Railroad Information Sheet
    b. ☐ The Overhead Submittal Checklists
    c. ☐ The Overhead Grade Separation Data Sheet

3S5 Develop Situation and Layout (S&L) for Bridge

Develop the draft S&L sheets to ensure the compatibility between the structures and roadway design.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Guide Specifications for LRFD Seismic Bridge Design
3. UDOT Structures Design and Detailing Manual
4. UDOT CADD Standards
5. UDOT Standard and Supplemental Drawings
6. UDOT Project Delivery Network
7. UDOT QC/QA Procedures
8. UDOT Practical Design Guide

S&L Sheets

1. ☐ Bridge S&L sheets are complete.
    a. ☐ The design meets the project criteria.
    b. ☐ All recommendations from the hydraulic/scour report are addressed.
    c. ☐ The design conforms to UDOT and industry standards.
    d. ☐ The structure can be reasonably constructed and has a plausible phasing scheme.
2. ☐ If a railroad is within the structure limits, the following are complete and ready to submit to the Railroad Company.
    a. ☐ Required Railroad Information Sheet
    b. ☐ Overhead Submittal Checklists
    c. ☐ Overhead Grade Separation Data Sheet

Initial Design Exception, Design Waiver, or Deviation from UDOT Standard Form

1. ☐ All design exceptions, design waivers, and deviations from UDOT standards considered are appropriate.
2. ☐ All necessary forms have been submitted.

4SA Design and Detail Bridge

Based on the approved S&Ls and the structural design criteria, design, detail, and check the bridge. Incorporate design requirements and the preliminary information from the draft geotechnical report and/or the hydraulic report.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Manual for Condition Evaluation and Load and Resistance Factor
3. AASHTO Guide Specifications for LRFD Seismic Bridge Design
4. UDOT Structures Design and Detailing Manual
5. UDOT CADD Standards
6. UDOT Standard and Supplemental Drawings
7. UDOT Project Delivery Network
8. UDOT QC/QA Procedures
9. UDOT Practical Design Guide

Superstructure Calculations

1. ☐ All design calculations to meet UDOT and industry standards.
2. ☐ All computer input was correctly entered and verified.
3. ☐ All assumptions are properly documented and justified.
4. ☐ All superstructure review comments are addressed and incorporated.

Superstructure Plans

1. ☐ The disciplines affected by the design (roadway, geotechnical, hydraulics) reviewed the design.
2. ☐ All additional right-of-way needs (temporary or permanent) are identified and coordinate with the right-of-way design team.
3. ☐ Superstructure plan and detail sheets are complete.
    a. ☐ All necessary details to adequately construct the bridge are included.
    b. ☐ All plan and detail sheets conform to *UDOT Structures Design and Detailing Manual*.
    c. ☐ All sheets are cut appropriately.
    d. ☐ All reference files are properly attached.
    e. ☐ *UDOT CADD Standards* are followed and maintained on each sheet.
    f. ☐ Call-out rules are followed.
    g. ☐ All title blocks are filled out correctly.
    h. ☐ All necessary callouts, notes, identifiers, symbols and information are provided and correct.
    i. ☐ All applicable notes (general and construction) are included and correct.
4. ☐ All superstructure plan sheet review comments are addressed and incorporated.

Substructure Design Calculations

1. ☐ All design calculations meet UDOT and industry standards.
2. ☐ All computer input was correctly entered and verified.
3. ☐ All assumptions are properly documented and justified.
4. ☐ All previous substructure review comments are addressed and incorporated.

Substructure Plans

1. ☐ The disciplines affected by the design (roadway, geotechnical, TMD) reviewed the design.
2. ☐ All additional right-of-way needs (temporary or permanent) are identified and coordinated with the right-of-way design team.
3. ☐ Substructure plan and detail sheets are complete.
    a. ☐ All necessary details to adequately construct the bridge are included.
    b. ☐ All plan and detail sheets conform to *UDOT Structures Design and Detailing Manual*.
    c. ☐ All sheets are cut appropriately.
    d. ☐ All reference files are properly attached.
    e. ☐ *UDOT CADD Standards* are followed and maintained on each sheet.
    f. ☐ Call-out rules are followed.
    g. ☐ All title blocks are filled out correctly.
    h. ☐ All necessary callouts, notes, identifiers, symbols and information are provided and correct.
    i. ☐ All applicable notes (general and construction) are included and correct.
4. ☐ All previous substructure review comments are addressed and incorporated.

Final Seismic Strategy Report

1. ☐ The design strategy for resisting the design seismic event is acceptable.
    a. ☐ Descriptions for of expected damage, locations of plastic hinging, redistribution forces, mobilization of backfills, and functions of bearings are included as appropriate.
    b. ☐ Existing structures evaluated for seismic retrofit if applicable.

Load Rating VIRTIS Model

1. ☐ Design load ratings use methods described in the *AASHTO Manual for Condition Evaluation and Load and Resistance of Highway Bridges*.
2. ☐ Inventory and operating ratings are provided.

4SA Continued

3. ☐ All computer input was entered correctly.
4. ☐ All load ratings were calculated in Load Rating VIRTIS Model software.

Railroad Package

1. ☐ If a railroad is within the structure limits, the following are complete and ready to submit to the Railroad Company.
    a. ☐ 60% calculations for underpass structures (if applicable)
    b. ☐ 60% plans for underpass structures (if applicable)
    c. ☐ Final design calculations for underpass structure
    d. ☐ Final design plans for underpass structure
    e. ☐ Geotechnical report

4SM Design and Detail Minor Structure

Design, detail, and check of the minor structure.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Manual for Condition Evaluation and Load and Resistance Factor
3. AASHTO Guide Specifications for LRFD Seismic Bridge Design
4. UDOT Structures Design and Detailing Manual
5. UDOT CADD Standards
6. UDOT Standard and Supplemental Drawings
7. UDOT Project Delivery Network
8. UDOT QC/QA Procedures
9. UDOT Practical Design Guide

Minor Structure Design Calculations

1. ☐ All box culverts, headwalls, and other drainage structures meet hydraulic requirements.
2. ☐ All headwalls and wingwalls meet grading requirements.
3. ☐ Minor structure design meets requirements of the geotechnical report.
4. ☐ The design meets UDOT and industry standards.
5. ☐ All computer input was correctly entered and verified.
6. ☐ All assumptions are properly documented and justified.
7. ☐ All minor structure review comments are addressed and incorporated.

Minor Structure Plans

1. ☐ The disciplines affected by the structure design (roadway, geotechnical, hydraulics) reviewed the minor structures design.
2. ☐ All additional right-of-way needs (temporary or permanent) are identified and coordinated with the right-of-way design team.
3. ☐ Minor structure plan and detail sheets are complete.
   a. ☐ All minor structures and details to adequately construct the structure are included.
   b. ☐ All plan and detail sheets conform to *UDOT Structures Design and Detailing Manual*.
   c. ☐ All sheets are cut appropriately.
   d. ☐ All reference files are properly attached.
   e. ☐ *UDOT CADD Standards* are followed and maintained on each sheet.
   f. ☐ Call-out rules are followed.
   g. ☐ All title blocks are filled out correctly.

4SM Continued

h. ☐ All necessary callouts, notes, identifiers, symbols and information are provided and correct.

i. ☐ All applicable notes (general and construction) are included and correct.

Load Rating VIRTIS Model

1. ☐ Design load ratings use methods described in the *AASHTO Manual for Condition Evaluation and Load and Resistance of Highway Bridges.*
2. ☐ Inventory and operating ratings are provided.
3. ☐ All computer input was entered correctly.
4. ☐ All load ratings were calculated in Load Rating VIRTIS Model software.

4S1 Design and Detail Rehabilitation

Develop the rehabilitation procedures and repairs. Develop and check plans for the repair based on the design.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Manual for Condition Evaluation and Load and Resistance Factor
3. AASHTO Guide Specifications for LRFD Seismic Bridge Design
4. UDOT Structures Design and Detailing Manual
5. UDOT CADD Standards
6. UDOT Standard and Supplemental Drawings
7. UDOT Project Delivery Network
8. UDOT QC/QA Procedures
9. UDOT Practical Design Guide

Structure Rehabilitation Design Calculations

1. ☐ All rehabilitation measures conform to UDOT and industry standards.
2. ☐ The rehabilitation measures meet project design requirements, including hydraulic and roadway needs.
3. ☐ All computer input was correctly entered.
4. ☐ All assumptions are properly documented and justified.
5. ☐ All structure rehabilitation comments are addressed and incorporated.

Structure Rehabilitation Plans

1. ☐ The disciplines affected by the design (roadway, geotechnical, TMD) reviewed the design.
2. ☐ All additional right-of-way needs (temporary or permanent) are identified and coordinated with the right-of-way design team.
3. ☐ All structure rehabilitation plan and detail sheets are complete.
    a. ☐ All necessary details to construct the rehabilitation measures are included.
    b. ☐ All plan and detail sheets conform to *UDOT Structures Design and Detailing Manual*.
    c. ☐ All sheets are cut appropriately.
    d. ☐ All reference files are properly attached.
    e. ☐ *UDOT CADD Standards* are followed and maintained on each sheet.
    f. ☐ Call-out rules are followed.
    g. ☐ All title blocks are filled out correctly.
    h. ☐ All necessary callouts, notes, identifiers, symbols and information are provided and correct.
    i. ☐ All applicable notes (general and construction) are included and correct.

Load Rating VIRTIS Model

1. ☐ Design load ratings use the methods described in *Manual for Condition Evaluation and Load and Resistance at Highway Bridges.*
2. ☐ Inventory and operating ratings are provided.
3. ☐ All computer input was entered correctly.
4. ☐ All load ratings were calculated in Load Rating VIRTIS Model software.

Railroad Package

1. ☐ If a railroad is within the structure limits, the following are complete and ready to submit to the Railroad Company.
    a. ☐ 60% calculations for underpass structures (if applicable)
    b. ☐ 60% plans for underpass structures (if applicable)
    c. ☐ Final design calculations for underpass structure
    d. ☐ Final design plans for underpass structure
    e. ☐ Geotechnical report

4S2 Design and Detail Overhead Sign/VMS Structures

Based on the approved sign panel size and layout, design, detail, and check the sign structure supports.

References

1. AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signs
2. UDOT Structures Design and Detailing Manual
3. UDOT CADD Standards
4. UDOT Standard and Supplemental Drawings
5. UDOT Project Delivery Network
6. UDOT QC/QA Procedures
7. UDOT Practical Design Guide

Sign Structure Design Calculations

1. ☐ The Traffic Management Department (TMD) has verified the locations of required conduits.
2. ☐ The UDOT standard designs are used were the design parameters are met by the standard design.
3. ☐ The design conforms to UDOT and industry standards.
4. ☐ The correct loads and loadings are used.
5. ☐ All calculations use the correct material properties.
6. ☐ The foundation calculations are correct.
7. ☐ The sign structure design calculations meet the required clearances and geometry.
8. ☐ All computer input was correctly entered.
9. ☐ All assumptions are properly documented and justified.
10. ☐ All overhead sign/VMS structure comments are addressed and incorporated.

Sign Structure Plans

1. ☐ Disciplines affected by the structure design (roadway, geotechnical, hydraulics) reviewed the design.
2. ☐ All additional right-of-way needs for the overhead sign/VMS design are identified and coordinated with the right-of-way design team.
3. ☐ All sign/VMS plan and detail sheets are complete.
    a. ☐ All necessary details to construct the sign/VMS structure are included.
    b. ☐ All sheets conform to *UDOT Structures Design and Detailing Manual*.
    c. ☐ All sheets are cut appropriately.
    d. ☐ All reference files are properly attached.
    e. ☐ *UDOT CADD Standards* are followed and maintained on each sheet.
    f. ☐ Call-out rules are followed.

4S2 Continued

g. ☐ All title blocks are filled out correctly.

h. ☐ All necessary callouts, notes, identifiers, symbols and information are provided and correct.

i. ☐ All applicable notes (general and construction) are included and correct.

4S3 Design and Detail Retaining Wall

Based on the roadway requirements, design and detail the wall layout and plans.

References

1. AASHTO LRFD Bridge Design Specifications
2. AASHTO Guide Specifications for LRFD Seismic Bridge Design
3. UDOT Structures Design and Detailing Manual
4. UDOT CADD Standards
5. UDOT Standard and Supplemental Drawings
6. UDOT Project Delivery Network
7. UDOT QC/QA Procedures
8. UDOT Practical Design Guide

Wall Design Calculations

1. ☐ All wall design calculations meet project criteria.
2. ☐ All wall calculations meet UDOT and industry standards.
3. ☐ All computer input was correctly entered.
4. ☐ All assumptions are properly documented and justified.
5. ☐ All retaining wall comments are addressed and incorporated.

Wall Plans

1. ☐ Disciplines affected by the structure design (roadway, geotechnical, hydraulics) reviewed the design.
2. ☐ All additional right-of-way needs for the wall design are identified and coordinated with the right-of-way design team.
3. ☐ The wall plans meet UDOT and industry standards.
4. ☐ All retaining wall plan and detail sheets are complete.
    a. ☐ All necessary details to construct the retaining wall are included.
    b. ☐ All sheets conform to *UDOT Structures Design and Detailing Manual*.
    c. ☐ All sheets are cut appropriately.
    d. ☐ All reference files are properly attached.
    e. ☐ *UDOT CADD Standards* are followed and maintained on each sheet.
    f. ☐ Call-out rules are followed.
    g. ☐ All title blocks are filled out correctly.
    h. ☐ All necessary callouts, notes, identifiers, symbols and information are provided and correct.
    i. ☐ All applicable notes (general and construction) are included and correct.

4S4 Complete Structure Project Documents

Finalize the structure plans, calculations, special provisions, measure and payment, and estimate.

References

1. UDOT Structures Design and Detailing Manual
2. UDOT CADD Standards
3. UDOT Standard and Supplemental Drawings
4. UDOT Standard and Supplemental Specifications
5. Specification Writer's Guide
6. Measurement and Payment Template
7. Acceptance and Documentation Guide
8. UDOT Project Delivery Network
9. UDOT QC/QA Procedures
10. UDOT Practical Design Guide

Structure Project Documents

1. ☐ All **Plan Sheets** are complete.
2. ☐ All calculations are complete.
3. ☐ The cost estimate is complete and all bid items are included.
4. ☐ All **Special Provisions** are complete.
   a. ☐ All special provisions conform to the *Specification Writer's Guide* (verify using Chapter 11 Checklist).
   b. ☐ A special provision was created for each non-standard item.
   c. ☐ All general and project specific special provision content is accurate, complete, and does not contain anything unnecessary.
5. ☐ The **Measurement & Payment** is complete.
   a. ☐ All M&P items match pay items exactly.
   b. ☐ For all non-standard pay items, a complete and correct M&P description of all effort and materials is included.
   c. ☐ All units are correct.
6. ☐ The **Acceptance & Documentation** is complete.
   a. ☐ All A&D items match pay items exactly.
   b. ☐ For all non-standard pay items, a complete and correct A&D is included.

Estimate Review Checklist

Provide review checklist of all design cost estimates.

References

1. Estimating – Roadway Design Manual of Instruction (Section 7.19)
2. Estimator's Corner Website
3. UDOT Project Delivery Network
4. Project Development Business System

Estimate (applies to every stage for updating the estimate)

1. ☐ All necessary bid items are included.
2. ☐ All quantities and units are correct.
3. ☐ All standard bid items match UDOT standard bid items exactly.
4. ☐ Unit prices were estimated using UDOT approved methods (PDBS, local contractors, etc.).
5. ☐ All unit price estimates are documented.
6. ☐ Unit prices reflect the following: (1)
   - a. ☐ Location
   - b. ☐ Time of year for advertising
   - c. ☐ Complexity of Constructability
   - d. ☐ Quantity of item
   - e. ☐ Limitations of operation
   - f. ☐ Current bidding environment
   - g. ☐ Availability of materials
   - h. ☐ Familiarity of a process
   - i. ☐ Specialty equipment
   - j. ☐ Risk to contractor
   - k. ☐ Inflation
   - l. ☐ Construction schedule
7. ☐ Lump sum bid prices are used only when appropriate. (i.e. unit pricing is to difficult)
8. ☐ All lump sum bid prices considered the following:
   - a. ☐ Contractor risk due to unknown quantity.
   - b. ☐ Difficulty in making it a unit price pay item.

Additional PS&E Estimate

9. ☐ All bid items, quantities, and units match the plan sheet callouts, summary sheets, and M&P exactly.